they are not induced to do this on account of their ripe­ness. The drought that prevails in their islands renders the rains which fall in September necessary to their plant­ing ; and as the canes are eighteen months in growing, this period always brings them to the precise point of maturity.@@1 “ The time of crop in the sugar islands,” says Mr Edwards, “ is the season of gladness and festivity to man and beast. So palatable, salutary, and nourishing, is the juice of the cane, that every individual of the animal creation, drinking freely of it, derives health and vigour from its use. The meagre and sickly among the negroes exhibit a surprising alteration in a few weeks after the mill is set in action. The labouring horses, oxen, and mules, though almost con­stantly at work during this season, yet, being indulged with plenty of the green tops of this noble plant, and some of the scummings from the boiling-house, improve more than at any other period of the year. Even the pigs and poultry fatten on the refuse. In short, on a well-regulated planta­tion, under a humane and benevolent director, there is such an appearance during crop-time of plenty and busy cheer­fulness, as to soften, in a great measure, the hardships of slavery, and induce a spectator to hope, when the miseries of life are represented as insupportable, that they are some­times exaggerated through the medium of fancy.”

The plants being cut, the branches at the top are given to the cattle for food ; the top-shoot, which is full of eyes, is preserved for planting. The canes are cut into pieces about a yard long, tied up in bundles, and carried in carts to the mill, where they are bruised, and the juice is extract­ed from them. The mill consists principally of three up­right iron-plated rollers or cylinders, from thirty to forty inches in length, and from twenty to twenty-five inches in diameter ; and the middle one, to which the moving power is applied, turns the other two by means of cogs. Between these rollers, the canes, being previously cut short, and tied into bundles, are twice compressed ; for, having passed through the first and second rollers, they are turned round the middle one by a circular piece of frame-work or screen, called in Jamaica the *dumb-returner,* and forced back through the second and third ; an operation which squeezes them completely dry, and sometimes even reduces them to powder. The cane juice is received in a leaden bed, and thence conveyed into a vessel called the *receiver.* The refuse, or macerated rind, of the cane, which is called *cane-trash,* in contradistinction to *field-trash,* serves for fuel to boil the liquor.

The juice as it flow’s from the mill, taken at a medium, contains eight parts of pure water, one part of sugar, and one part consisting of coarse oil and mucilaginous gum, with a portion of essential oil.

As this juice has a strong disposition to fermentation, it must be boiled as soon as possible. There are some water­mills that will grind with great ease canes sufficient for thir­ty hogsheads of sugar in a week. It is necessary to have boiling vessels, or clarifiers, that will correspond in dimen­sions to the quantity of juice flowing from the receiver. These clarifiers are commonly three in number, and are sometimes capable of containing 1000 gallons each ; but it is more usual to see them of 300 or 400 gallons each. Be­sides the clarifiers which are used for the first boiling, there are generally four coppers or boilers. The clarifiers are placed in the middle or at one end of the boiling-house. If at one end, the boiler called the *teache* is placed at the other, and several boilers, generally three, are ranged be­tween them. The teache is ordinarily from seventy to 100 gallons, and the boilers between the clarifiers and teache diminish in size from the first to the last. Where the cla­rifiers are in the middle, there is usually a set of three boilers on each side, which constitute in effect a double boiling-house. On very large estates this arrangement is found useful and necessary. The objection to so great **a** number is the expense of fuel ; to obviate which, in some degree, the three boilers on each side of the clarifiers are commonly hung to one fire.

The juice runs from the receiver along a wooden gutter lined with lead into the boiling-house, where it is received into one of the clarifiers. When the clarifier is filled, a fire is lighted, and a quantity of Bristol quicklime in pow­der, which is called *temper,* is poured into the vessel. The use of the lime is to unite with the superabundant acid, of which, for the success of the process, it is necessary to get rid. The quantity sufficient to separate the acid must vary according to the strength of the quicklime and the quality of the liquor. Some planters allow a pint of lime to every 100 gallons of liquor; but Mr Edwards thinks that little more than half the quantity is a better medium proportion, and, even then, that it ought to be dissolved in boiling water, that as little of it as possible may be preci­pitated. The heat is suffered gradually to increase till it approaches within a few degrees of the heat of boiling water, that the impurities may be thoroughly separated. But if the liquor were suffered to boil with violence, the impurities would again incorporate with it. It is known to be sufficiently heated when the scum begins to rise in blisters, which break into white froth, and appear gene­rally in about forty minutes. The fire is then suddenly extinguished by means of a damper, which excludes the external air; and the liquor is allowed to remain about an hour undisturbed, during which period the impurities are collected in scum on the surface. The juice is then drained off either by a syphon or a cock ; the scum, being of a tenacious gummy nature, does not flow out with the liquor, but remains behind in the clarifier. The liquid juice is conveyed from the clarifier by a gutter into the evaporating boiler, commonly termed the *grand copper ;* and if it has been obtained from good canes it generally appears transparent.

In the evaporating boiler, which should be large enough to receive the contents of the clarifier, the liquor is allow­ed to boil ; and as the scum rises it is taken off. The scumming and evaporation are continued till the liquor becomes finer and thicker, and so far diminished in bulk that it may be easily contained in the second copper. When put into the second copper, it is nearly of the co­lour of Madeira wine ; the boiling and scumming are con­tinued, and if the impurities be considerable, a quantity of lime-water is added. This process is carried on till the liquor be sufficiently diminished in quantity to be contain­ed in the third copper. After being purified a third time, it is put into the fourth copper, which is called the *teache,* where it is boiled and evaporated till it is judged suffici­ently pure to be removed from the fire. In judging of the purity of the liquor, many of the negroes, says Mr Ed­wards, guess solely by the eye (which by long habit they do with great accuracy), judging by the appearance of the grain on the back of the ladle : but the practice most in use is to judge by what is called the *touch, i. e.* taking up with the thumb a small portion of the hot liquor from the ladle, and, as the heat diminishes, drawing with the fore­finger the liquid into a thread. This thread will suddenly break, and shrink from the thumb to the suspended finger, in different lengths, according as the liquor is more or less boiled. The proper boiling height for strong muscovado sugar is generally determined by a thread of a quarter of an inch long. It is evident that certainty in this experi­ment can be attained only by long habit, and that no

@@@1 The account given in the text concerning the time when the sugar-canes arc collected, we have taken from the Abbé Raynal's History of the Trude and Settlements of the East and West Indica : but Mr Cazaud observes. that in Febuary, March, and April, all the canes, what­ever be their age, are as ripe as the nature of the suit ever allows them to be. (Philosophical Transactions, vol. lxix.)